

TITLE OF THE INVENTION

COMMUNICATION APPARATUS CAPABLE OF AUTOMATIC ACTIVATION
OF FORWARDING SETUP INSTRUCTED BY REMOTE ACCESS, AND
CONTROL METHOD THEREOF

5

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

The present invention relates to a communication
apparatus which can automatically activate the
10 forwarding setup instructed by remote access, and its
control method.

DESCRIPTION OF THE RELATED ART

As one of supplementary services of ISDN
15 (Integrated Services Digital Network), a call forwarding
unconditional (to be abbreviated as CFU hereinafter)
function is known.

The user can use this CFU when he or she makes a
contract with a telephone service company in advance.
20 With this service, when the user informs the network of
the telephone number of the own ISDN terminal apparatus
and a forwarded-to number, the network automatically
forwards an incoming call corresponding to the telephone
number of the own terminal apparatus to the forwarded-to
25 number.

In the conventional ISDN terminal apparatus with the CFU function, the user operates a console of his or her terminal apparatus to activate/deactivate CFU every time he or she wants to activate/deactivate CFU.

5 However, in the prior art, the user must directly operate the ISDN terminal apparatus every time he or she activates/deactivates CFU. (For example, even when the user wants to activate the CFU function at a visit site, he or she cannot activate the CFU function from the
10 visit site.

*problem
trying
to solve*

SUMMARY OF THE INVENTION

It is an object of the present invention to allow to activate a forwarding function such as CFU by remote
15 access.

It is another object of the present invention to inform the forwarding activation result instructed by remote access.

Other features and advantages of the present
20 invention will be apparent from the following description taken in conjunction with the accompanying drawings, in which like reference characters designate the same or similar parts throughout the figures thereof.

25 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing the arrangement of a facsimile apparatus according to an embodiment of the present invention;

Fig. 2 is a flow chart showing the operation according to the first embodiment of the present invention;

Fig. 3 is a flow chart showing the operation according to the second embodiment of the present invention; and

Fig. 4 is a flow chart showing the operation according to the third embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

(First Embodiment)

In the embodiment of the present invention, a facsimile apparatus will be exemplified as a kind of ISDN terminals in detail. Fig. 1 is a block diagram showing the arrangement of a facsimile apparatus of this embodiment.

An MPU 101 controls the overall apparatus via a system bus 112, and a ROM 102 stores a control program of the apparatus. A RAM 103 stores a remote access password, calling party number, forwarded-to number, notified-to number, destination telephone number, received image data, and the like.

A console 104 has operation keys used for making various inputs, and a display such as an LCD or the like for making various displays. A reader is a scanner for optically reading an original image. A timepiece unit
5 106 is a timer for measuring time, and a network control unit 107 connects or disconnects a call to or from the network.

A communication unit 108 modulates data to be transmitted to an ISDN line 113, demodulates data
10 received from the ISDN line 113, detects a DTMF (Dual Tone Multi-Frequency) signal, generates a voice guidance message, and so forth, so as to exchange data with a partner station. A recorder 109 is a printer for recording a received image or the like.

15 An encoder 110 encodes image data, and a decoder 111 decodes encoded image data.

Fig. 2 is a flow chart showing the operation upon activating CFU by remote access according to this embodiment.

20 In this embodiment, the user at a remote place, e.g., at a visit site, calls the facsimile apparatus of this embodiment (to be referred to as a remote-accessed facsimile hereinafter) from the handset of a facsimile apparatus to be designated as a forwarded-to site (to be
25 referred to as a remote facsimile hereinafter) via ISDN so as to activate CFU.

In the remote-accessed facsimile, the network control unit 107 automatically sets up a call in response to SETUP from the network (S201). In this case, when the network notifies the network control unit of
5 the calling party number, the network control unit stores this number as a forwarded-to number in the RAM 103.

The remote-accessed facsimile processes this call as a G3 communication since it is placed by a telephone,
10 and begins to detect DCS while outputting DIS (S202, S203). At the same time, the remote-accessed facsimile starts detection of a password using a DTMF signal (S204).

Upon detecting DCS, it is determined that the
15 calling party has requested a G3 FAX communication, and the control advances to a G3 FAX reception process (S212). Note that the G3 FAX reception process is known to those who are skilled in the art, and a detailed description thereof will be omitted.

20 Upon detecting the remote access password sent by the DTMF signal, the flow advances to step S205.

More specifically, when the user at the remote facsimile (calling party) confirms that a call has been set up at the remote facsimile (to open DIS), he or she
25 sends a remote access password using a DTMF signal to remote-access the remote-accessed facsimile. Note that

the user arbitrarily registers the remote access password in the remote-accessed facsimile by predetermined registration at the console 104, and the registered password is stored in the RAM 103.

5 Upon detecting the remote access password in step S204, the control of the remote-accessed facsimile advances to step S205 to evaluate the password. That is, the remote access password [registered in advance] in the RAM 103 of the remote-accessed facsimile is compared with that sent from the remote facsimile. If "non-coincidence" is detected, the call is disconnected to interrupt the process; otherwise, the flow advances to step S206.

10 In step S206, it is checked if the calling party number is stored in the RAM 103 as a forwarded-to number. If the network does not notify the apparatus of the calling party number upon receiving the call and no calling party number is stored in the RAM 103, the flow advances to step S207; otherwise, the flow advances to step S208.

20 In step S207, a forwarded-to number is received. Since the user does not know as to whether or not the remote-accessed facsimile is informed of the calling party number, a voice guidance message for prompting the user to notify the forwarded-to number is output. In

place of the voice guidance message, a predetermined tone signal or the like may be output.

In response to this signal, the user outputs a forwarded-to number using a DTMF signal, and the
5 remote-accessed facsimile stores the forwarded-to number sent from the user in the RAM 103.

If the forwarded-to number is wrong, not only the user feels inconvenient but also the user at the site which receives the call also experiences much trouble.
10 Hence, in step S209, if the forwarded-to number is right is evaluated. More specifically, if the forwarded-to number is the calling party number notified from the network in step S201, it is unconditionally determined to be "right", and the flow advances to step S209.

15 However, when the forwarded-to number is notified by user's operation in step S207, that number is evaluated by combining a method of making the user confirm the number by means of a voice message, a method of comparing the forwarded-to number with destination
20 telephone numbers registered in the remote-accessed facsimile and determining "right" if coincidence is detected, and the like.

As a result, if the forwarded-to number is right, the flow advances to step S209; otherwise, the call is
25 disconnected to interrupt the process. In this embodiment, the call is disconnected if it is determined

in step S208 that the forwarded-to number is wrong.
Alternatively, the remote-accessed facsimile may ask the user to transmit the forwarded-to number again.

In step S209, the user notifies an activation time
5 period or deactivation time for CFU using a DTMF signal or modem signal in accordance with a voice guidance message or tone signal output from the remote-accessed facsimile. The remote-accessed facsimile receives that time period or time, and stores it in the RAM 103.

10 In step S210, the user is informed using a voice message or tone signal that a call forwarding instruction has been normally accepted. The call is disconnected in step S211, and an activation request of CFU to the forwarded-to number stored in the RAM 103 is
15 issued to the network in step S212.

After that, the control stays in the loop of step S213 until the time designated in step S209 is reached or the designated time period elapses, thus activating CFU.

20 If the time designated in step S209 has been reached or the designated time period has elapsed, the control leaves the loop in step S213, and outputs a CFU deactivation request to the network in step S214, thus ending the process.

25 In this manner, according to this embodiment, the user at a visit side or the like can activate the call

forwarding function of the remote-accessed facsimile,
and can instruct the apparatus to deactivate the call
forwarding function at the designated time or after an
elapse of the designated time period. Hence, the user
5 can desirably operate the remote-accessed facsimile from
a visit site to utilize the CFU function.

(Second Embodiment)

In this embodiment as well, a facsimile apparatus
will be exemplified as a kind of ISDN terminals in
10 detail. The arrangement of the facsimile apparatus of
this embodiment is the same as that of the first
embodiment shown in Fig. 1, and a detailed description
thereof will be omitted.

Fig. 3 is a flow chart showing operation upon
15 activating CFU by remote access according to this
embodiment.

In this embodiment, the user at a remote place,
e.g., at a visit side, calls the facsimile apparatus of
this embodiment (to be referred to as a remote-accessed
20 facsimile hereinafter) from the handset of a facsimile
apparatus to be designated as a forwarded-to site (to be
referred to as a remote facsimile hereinafter) via ISDN
so as to activate CFU.

In the remote-accessed facsimile, the network
25 control unit 107 automatically sets up a call in
response to SETUP from the network (S301). In this case,

the calling party number sent from the network is stored in the RAM 103 to prepare for a case wherein the step of outputting a forwarded-to number later is skipped.

The remote-accessed facsimile processes this call
5 as a G3 communication since it is placed by a telephone, and begins to detect DCS while outputting DIS (S302, S303). At the same time, the remote-accessed facsimile starts detection of a password using a DTMF signal (S304).

10 Upon detecting DCS, it is determined that the calling party has requested a G3 FAX communication, and the control advances to a G3 FAX reception process (S317). Note that the G3 FAX reception process is known to those who are skilled in the art, and a detailed
15 description thereof will be omitted.

Upon detecting the remote access password by the DTMF signal, the flow advances to step S305.

More specifically, when the user at the remote facsimile (calling party) confirms that the call has
20 been set up at the remote facsimile (to open DIS), he or she sends a remote access password using a DTMF signal to remote-access the remote-accessed facsimile. Note that the user arbitrarily registers the remote access password in the remote-accessed facsimile by
25 predetermined registration at the console 104, and the registered password is stored in the RAM 103.

Upon detecting the remote access password in step S304, the control of the remote-accessed facsimile advances to step S305 to evaluate the password. That is, the remote access password registered in advance in the
5 RAM 103 of the remote-accessed facsimile is compared with that sent from the remote facsimile. If "non-coincidence" is detected, the call is disconnected to interrupt the process; otherwise, the flow advances to step S306.

10 In step S306, a forwarded-to number and notified-to number are received. The user sends the forwarded-to number and notified-to number using a DTMF signal, modem signal, or the like in accordance with a voice guidance message or tone signal output from the
15 remote-accessed facsimile, and the remote-accessed facsimile stores the forwarded-to number and notified-to number sent from the user in the RAM 103.

In this case, sending of the notified-to number is not mandatory, and if that number is not designated, the
20 forwarded-to number is also used as the notified-to number. Also, sending of the forwarded-to number can be skipped if the calling party number is stored in step S301 as in the first embodiment.

If the forwarded-to number is wrong, not only the
25 user feels inconvenient but also the user at the site which receives the call also experiences much trouble.

Hence, in step S307, if the forwarded-to number is right is evaluated. More specifically, if the forwarded-to number is the calling party number notified from the network in step S301, it is unconditionally determined
5 that the forwarded-to number is "right", and the flow advances to step S308.

However, when the forwarded-to number is notified by user's operation in step S306, that number is evaluated by combining a method of making the user
10 confirm the number by means of a voice message, a method of comparing the forwarded-to number with destination telephone numbers registered in the remote-accessed facsimile and determining "right" if coincidence is detected, and the like.

15 As a result, if the forwarded-to number is right, the flow advances to step S308; otherwise, the call is disconnected to interrupt the process. In this embodiment, the call is disconnected if it is determined in step S307 that the forwarded-to number is wrong.
20 Alternatively, the remote-accessed facsimile may ask the user to transmit the forwarded-to number again.

In step S308, the user notifies an activation time period or deactivation time of CFU using a DTMF signal or modem signal in accordance with a voice guidance
25 message or tone signal output from the remote-accessed

facsimile. The remote-accessed facsimile receives that time period or time, and stores it in the RAM 103.

In step S309, the user is informed using a voice message or tone signal that a call forwarding

5 instruction has been normally accepted. The call is disconnected in step S310, and an activation request of CFU to the forwarded-to number stored in the RAM 103 is issued to the network in step S311. At this time, the activation result notified from the network is stored in
10 the RAM 103.

After the CPU activation request process in step S311, if the notified-to number is stored, that number is called; otherwise, the forwarded-to number is called to notify the user of the CFU activation request result
15 stored in the RAM 103 by means of a voice message or tone signal (S312).

Note that the user may leave the forwarded-to site as soon as he or she activates CFU of the facsimile at his home or office by remote access. Hence, notification
20 of the CFU activation request result to the user may be turned "ON/OFF" in user setups. More specifically, such CFU activation request result notification mode may be allowed to be registered in a predetermined area of the RAM 103 of the remote-accessed facsimile as a result
25 notification mode, and notification may be skipped in decision of the remote-accessed facsimile.

Alternatively, the user may be allowed to turn on/off result notification using a DTMF signal from the remote facsimile in step S306. If "result notification ON" is selected, the notified-to number may be received, and the result notification mode may be set.

In step S313, the CFU activation request result is evaluated. If CFU activation is rejected or fails, the process is interrupted; otherwise, the flow advances to step S314.

In step S314, the control stays in the loop of step S314 until the time designated in step S308 is reached or the designated time period elapses, thus activating CFU.

If the time designated in step S308 has been reached or the designated time period has elapsed, the control leaves the loop in step S314, outputs a CFU deactivation request to the network, and stores a deactivation result sent from the network at that time in the RAM 103 in step S315.

In step S316, if the notified-to number is stored, that number is called; otherwise, the forwarded-to number is called to notify the user of the CFU deactivation result stored in the RAM 103 in step S315 by means of a voice message or tone signal, thus ending the process.

Note that the user may leave the forwarded-to site as soon as he or she activates CFU of the facsimile at his home or office by remote access. Hence, notification of the CFU deactivation result to the user may be turned

5 "ON/OFF" in user setups. More specifically, such CFU deactivation result notification mode may be allowed to be registered in a predetermined area of the RAM 103 of the remote-accessed facsimile as a result notification mode, and notification may be skipped in decision of the

10 remote-accessed facsimile. In this way, unwanted calls can be prevented from being placed.

Also, as in the setups of notification of the CFU activation request result, the notification mode of the CFU deactivation result may be turned "ON/OFF" using a

15 DTMF signal from a remote facsimile.

By combining setups of this CFU deactivation result notification mode and the CFU activation request notification mode described above in step S312, either or both of CFU activation request result and CFU

20 deactivation result can be desirably notified.

As described above, according to this embodiment, the user can issue a CFU activation request and CFU deactivation request at a designated time or after an elapse of a designated period of time from a telephone

25 at a visit site to the remote-accessed facsimile, and can reliably recognize the CFU activation state by

receiving the CFU activation request result. Furthermore,
the user can also receive the CFU deactivation request
result at the designated time or after an elapse of the
designated period of time. Hence, after this message,
5 the user can designate another forwarded-to site or can
instruct to extend the forwarding time period, thus
desirably utilizing the CFU function.

(Third Embodiment)

In the first and second embodiments described
10 above, when the calling party number is received from
the network upon receiving a call, the received calling
party number is unconditionally used as a forwarded-to
number.

However, an apparatus used for making remote
15 access is not always used as a forwarded-to apparatus.

That is, the user may want to forward data to an
apparatus different from the apparatus he or she is
using to make remote access.

In this embodiment, each user who makes remote
20 access is inquired as to whether or not the calling
party number received upon reception of a call is used
as a forwarded-to number, and whether or not the calling
party number is used as a forwarded-to number is
determined by user instruction.

25 With this control, the user can use the calling
party number as a forwarded-to number, or when the user

wants to use an apparatus different from that he or she used to place that call, he or she can designate that apparatus as a forwarded-to site apparatus.

In this embodiment as well, a facsimile apparatus
5 will be exemplified as a kind of ISDN terminals in detail. The arrangement of the facsimile apparatus of this embodiment is the same as that of the first embodiment shown in Fig. 1, and a detailed description thereof will be omitted.

10 Fig. 4 is a flow chart showing operation upon activating CFU by remote access according to this embodiment.

Note that steps S401 to S405 and S417 in Fig. 4 are the same as steps S201 to S205 and S215 in Fig. 2
15 described in the first embodiment, and steps S301 to S305 and S317 in Fig. 3 described in the second embodiment, and a detailed description thereof will be omitted.

In step S406 in Fig. 4 it is checked if a calling
20 party number is stored in the RAM 103 in step S401. If no calling party number is stored, the flow advances to step S407; otherwise, the flow advances to step S415.

In step S415, the user who made access is notified of the calling party number received in step S401, and a
25 message that inquires the user as to whether or not the

calling party number is used as a forwarded-to number is transmitted.

It is then checked in step S416 based on the user's instruction using a DTMF signal if the calling
5 party number is used as a forwarded-to number. If the calling party number is not used as a forwarded-to number, the flow advances to step S407; otherwise, the flow advances to step S408.

In step S407, a voice guidance that prompts the
10 user who made remote access to transmit a forwarded-to number is output, and the forwarded-to number sent from the user is received. Then, the flow advances to step S408. Note that a predetermined tone signal or the like may be output in place of the voice guidance.

15 If the forwarded-to number is wrong, not only the user feels inconvenient but also the user at the site which receives the call also experiences much trouble. Hence, in step S408, if the forwarded-to number is right is evaluated. If it is evaluated that the received
20 number is "right", the flow advances to step S409; otherwise, the call is disconnected to interrupt the process. As in the first and second embodiments, the control may ask the user to re-send a forwarded-to number.

25 Upon evaluating if the forwarded-to number is right, as in the first and second embodiments, when the

forwarded-to number is the calling party number notified from the network in step S401, it is unconditionally determined that the forwarded-to number is "right"; if the forwarded-to number is received by user operation in
5 step S407, a method of making the user confirm the number by means of a voice message, a method of comparing the forwarded-to number with destination telephone numbers registered in the remote-accessed facsimile and determining "right" if coincidence is
10 detected, and the like are used.

In step S409, the user notifies an activation time period or deactivation time of CFU using a DTMF signal or modem signal in accordance with a voice guidance message or tone signal output from the remote-accessed
15 facsimile. The remote-accessed facsimile receives that time period or time, and stores it in the RAM 103.

In step S410, the user is informed using a voice message or tone signal that a call forwarding instruction has been normally accepted. The call is
20 disconnected in step S411, and an activation request of CFU to the forwarded-to number stored in the RAM 103 is issued to the network in step S412.

After that, the control stays in the loop of step S413 until the time designated in step S409 is reached
25 or the designated time period elapses, thus activating CFU.

If the time designated in step S409 has been reached or the designated time period has elapsed, the control leaves the loop in step S413, and outputs a CFU deactivation request to the network in step S414, thus
5 ending the process.

The above description touched upon neither CFU activation result notification nor CFU deactivation notification in the second embodiment. However, as in the second embodiment, CFU activation result
10 notification and CFU deactivation notification may be made.

As described above, according to this embodiment, even when the calling party number is received from the network upon reception of a call, the calling party
15 number can be used as a forwarded-to number or another telephone number can be used as the forwarded-to number.

Note that the operations described in the first to third embodiments above are done by the MPU 101 on the basis of the program stored in the ROM 102. However,
20 according to the present invention, such program may be stored in an external storage medium such as a floppy disk, hard disk, optical disk, CD-ROM, memory card, or the like, and may be loaded into the apparatus and executed by the MPU 101.

25 In the above description, a standalone facsimile apparatus has been exemplified. However, the present

invention is not limited to such specific apparatus, and can be similarly applied to other ISDN terminal apparatuses.

To recapitulate, according to the present
5 invention, a forwarding activation instruction and forwarding deactivation instruction at a designated time (or after an elapse of a designated time period) can be issued by remote access from a remote place to an apparatus in which forwarding such as CFU is to be
10 activated.

As many apparently widely different embodiments of the present invention can be made without departing from the spirit and scope thereof, it is to be understood that the invention is not limited to the specific
15 embodiments thereof except as defined in the appended claims.